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# **REPORT:**

# NAVACHAB GOLD MINE - TSF 3 ANNEX TO OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

PROJECT NUMBER: ECC-107-408-REP-02-D

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Management Plan

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Client Name: Mr. George Botshiwe

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JUNE 2023 REV 01 PAGE 2 OF 12



Navachab Gold Mine (Pty) Ltd.

# **TABLE OF CONTENTS**

Introduction	5
ain TSF 3 annex - Part of Domain 5 - Tailings	9
OF TABLES	
e 7 – Domain 3: Co-disposal facility and waste rock dump domain schedule	9
OF FIGURES	
e 1 – Navachab tailings and mine waste areas within mining licences and AWA	6
e 2 - TSF 3 northern and southern wall	6
e 3 – Sewerage and surface water quality monitoring locations	7
e 4 – Ground and surface water quality monitoring locations	8
e 5 - Air quality monitoring locations	8
	Introduction



Navachab Gold Mine (Pty) Ltd.

# **ABBREVIATIONS**

ABBREVIATION	DESCRIPTION				
AMD	acid mine drainage				
DWA	Department of Water Affairs				
ECC	Environmental Compliance Consultancy				
ECO	environmental control officer				
EIA	environmental impact assessment				
EMA	Environmental Management Act				
EMS	environmental management system				
EPL	Exploration Prospecting Licence				
ESIA	environmental social impact assessment				
GHG	greenhouse gas				
GIS	geographical information system				
MAWLR	Ministry of Agriculture, Water and Land Reform				
MEFT	Ministry of Environment, Forestry and Tourism				
ML	Mining Licence				
MSDS	Material Safety Data Sheet				
NHC	National Heritage Council				
OEMP	operational environmental management plan				
PCM	pollution control measures				
POI	point of interest				
SLM	sound level meter				
ToR	terms of reference				
tph	tonnes per hour				
TSF	tailings storage facility				
WRD	waste rock dump				

#### 1 INTRODUCTION

Environmental Compliance Consultancy (ECC) has been contracted by QKR Navachab Gold Mine (Navachab) to update the consolidated operational environmental management plan (OEMP) for activities on mining licence (ML) 31, ML 180, the accessory works area in ML 31, exclusive prospecting licence (EPL) 999 and EPL 3275.

Navachab is located near the town of Karibib in Namibia. Karibib is situated approximately 170 km northwest of Windhoek, the capital of Namibia (Error! Reference source not found.). N avachab, mainly an open pit mining operation, started production in 1989. The mine was wholly owned by AngloGold Ashanti Namibia up to 30 June 2014 when shareholding was transferred to QKR and Epangelo Mining. Underground mining activities commenced in the main pit in 2021.

In December 2022 the Ministry of Environment, Forestry and Tourism approved the consolidation of existing environmental clearance certificates (ECC) for ML 31 and the accessory works area in 31 as a standalone ECC for ML 31. This OEMP as revision 1 was in support of that application.

#### 1.1 NAVACHAB GOLD MINE

Navachab has two active EPLs, whereby active fieldwork in the form of soil sampling, geophysical sampling and drilling activities are conducted on a regular basis. Navachab is mined as a conventional open pit mine with the current Carbon-In-Pulp (CIP) plant having a production capacity of 160,000 tonnes per month (tpm). The production capacity from this plant will be increased to 250 000 tpm during the ramp up to a production level of 3 million tonnes per annum. Underground test mining has begun, designed to access high-grade ore. The geology and mineralisation of the underground ore is similar to the existing mine which will be processed after blending with run-of-pit ore. Test results to date are encouraging.

Navachab is developing an environmental and social impact assessment (ESIA) for the third tailing storage facility (TSF 3), establishment of an additional raw water storage dam and expansion of co-disposal facilities to active waste rock dumps, that falls under the ECC for ML 31. ECC has compiled this operational environmental management plan in terms of the Environmental Management Act (EMA), No.7 of 2007 and its regulations of 2012 to support the amendment application.

**JUNE 2023 PAGE 5 OF 12** RFV 01

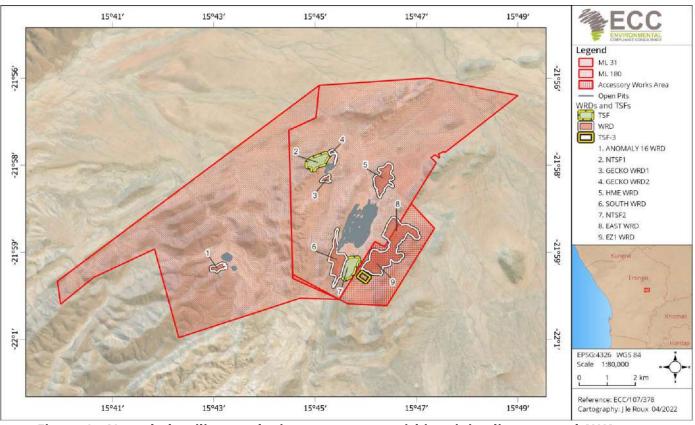


Figure 1 - Navachab tailings and mine waste areas within mining licences and AWA

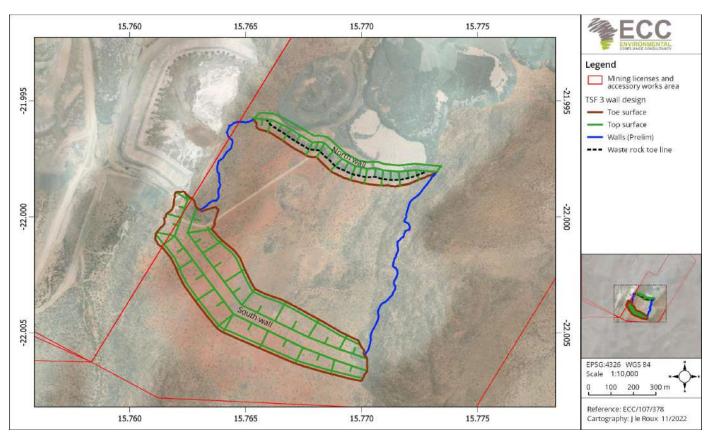


Figure 2 - TSF 3 northern and southern wall



# 1.2 Surface water quality monitoring

The objective of monitoring surface water is to determine the baseline to mining operations water quality and draw conclusion on the impacts and identify further mitigation.

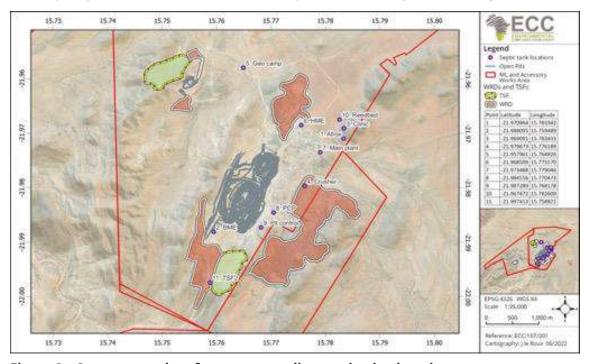
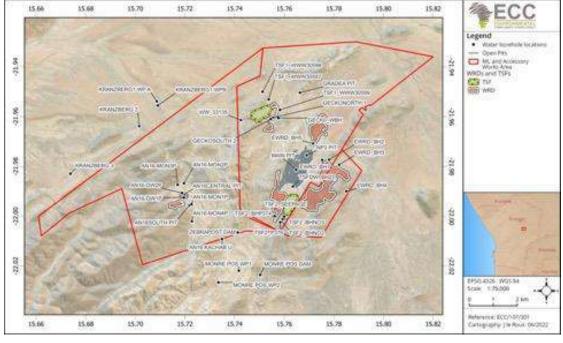


Figure 3 - Sewerage and surface water quality monitoring locations

# 1.3 GROUNDWATER QUALITY MONITORING

Monitoring boreholes provide a baseline and ongoing database to determine the quality of groundwater prior to and during operations to identify and further mitigate impacts.



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#### Figure 4 - Ground and surface water quality monitoring locations

#### 1.4 AIR QUALITY MONITORING

Air quality monitoring is conducted in locations downwind of Project activities and near se

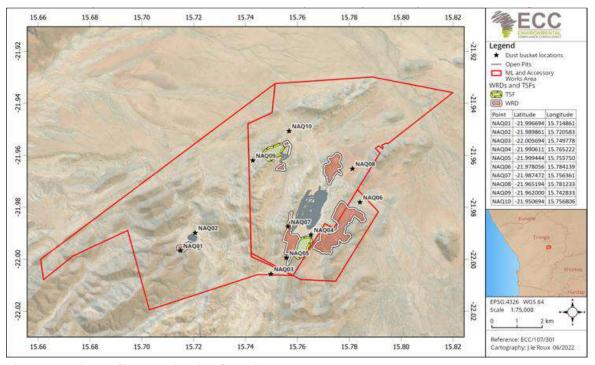


Figure 5 - Air quality monitoring locations

#### 1.5 Noise monitoring

Noise and vibration monitoring is conducted on a monthly basis, at pre-determined third-party locations in close vicinity to mining operations. Ground vibrations measured should be less than 12 mm/s peak particle velocity. Air blasts measured should be less than 130 dB. The equipment used for this monitoring must be calibrated on an annual basis as per ISO 14001 standards. Locations and structures in and around the mine can also be monitored, however the velocity and sound measurements will differ dependent on the distance from blasting operations. Noise and vibration monitoring results are reported on a monthly basis internally and be included in the bi-annual environmental performance report to MEFT.



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# **DOMAIN TSF 3 ANNEX - PART OF DOMAIN 5 - TAILINGS**

The schedule includes all infrastructure and activities within the operational control of the domain outlined and mapped below:

- Nearby access roads;
- North and south embankments and related landforms;
- Power;
- Barge and pumps;
- Tailings pipeline and spigots and any cyclones that might be in use;
- Reclaim water pipeline;
- Fencing; and
- Monitoring and survey equipment.

The mill department is responsible for:

• Design, approval, construction, operation, maintenance, surveillance (OMS) of TSF 3

The environmental department and mine surveyors are responsible respective monitoring.

Table 1 – Domain 3: Co-disposal facility and waste rock dump domain schedule

Domain 5 - Tailings - TSF 3 Annes to Domain 5					
Environmental	Consequence	Likelihood		Risk	
risk of domain	Major 4	Possible 3		Major 9	
Domain	Mill Manager				
manager					
Statutory	Permit / Permit name		Environmental permit conditions		
requirements	In the event that new tailings storage				
	facility needs to be established:				
	Where practical and require	ted on permit. General			
	land clearing permit from th	ring permit from the Ministry of conditions may i			
	Agriculture, Water and Fore	restry (MAWF) Number of protected trees to be			
	(Only valid for 3 months the	erefore must removed, area cleared and survey			
	be applied for in advance of	r in advance of clearing photos and use of resources clear			
	works)	e.g. rehabilitation			
Potential issues	Water				
or impacts	– Potential for water contamination (cumulative) with a third TSF (acid rock				
	drainage, CN, sulphate)				
	Biodiversity and ecological function (services, such as soil/ecosystem)				
	Excessive clearing of vegetation for footprint and Loss of habitat				
	- Barrier to wildlife movement				
	- Potential for (cumulative) impacts to soils/ecosystems/habitat, flora, fauna due				
	from construction an operation of a third TSF				
	Infrastructure and water resource impact from (multiple) embankment				
	failure(s) due to earthqu	ıake or unusuall	ly high p	ore pressure; affecting farm	
	infrastructure and AN16 to the southwest.				

ECC Report Nº: ECC-107-408-REP-02-D



Navachab Gold Mine (Pty) Ltd.

Domain 5 – Taili	ngs - TSF 3 Annes to Domain 5				
Targets	Air Quality  - Dust generated from tailings  - Dust generated heavy equipment during constructions  Social  - Nuisance noise and dust  Zero noise and dust complaints from neighbouring  Air quality monitoring reflects that the surfaces have	community			
	compliance commitment applied to the dust thresh 100% prevention of groundwater contamination No clearing for footprint without land clearing pern or substrate material for rehabilitation is possible (Compliant/below threshold on pore water pressure embankment inspections, maintenance, and audits TSF operated to the satisfaction of the site's to-be-etailings review board as per commitment to Canadi	nits where recovery of topsoil 10 days notices to be given) e, regular tailings and s established international			
Operational management measures	To minimise the effects the above-mentioned impacts may have on the environment and community, the domain manager will ensure the following measures are implemented:				
	<ul> <li>A robust monitoring system is in place to predict and prevent ARD.</li> <li>In the event PAF is identified, the SOP for PAF is triggered and PAF material is sampled and characterised, encapsulated, surveyed, and signed off.</li> <li>Land clearing permits are applied from the appointed ECO in advance. The domain manager should ensure that the Land Clearing permit process is triggered at the mine planning stage and therefore must include environmental consideration for future works, this is important in areas where recovery of topsoil or substrate material for rehabilitation is possible.</li> <li>Ensure a proactive approach to weather monitoring and when high winds are predicted, ensure an operational water system (spigots/sprinklers) is deployed to prevent excess dust being generated off the surface of the tailings.</li> <li>Implement measures to reduce noise from the facility (construction and maintenance heavy equipment) if monitoring/community feedback detects noise breaches (especially at night).</li> <li>Monitor pore water pressure and regular tailings and embankment monitoring, maintenance, inspection and audits</li> <li>Oversight by the site's to-be-established international tailings review board as per commitment to Canadian/international standards.</li> <li>Ensure the closure plan includes provisions for rehabilitation and that the schedule is adhered to prevent visual impacts from unrehabilitated areas.</li> </ul>				
Environmental	PCM risk score Function and	Maintenance frequency			
pollution	performance				

JUNE 2023 REV 01 PAGE 10 OF 12 ECC Report №: ECC-107-408-REP-02-D



Navachab Gold Mine (Pty) Ltd.

Domain 5 - Tailings - TSF 3 Annes to Domain 5							
control	Water cart		Water surfaces to		As per PMS		
measures	Moderate 8		prevent dust				
(PCM)	ARD SOP Moderate 8		Monitor tailings for		Reviewed annually		
			potentially acid forming				
			material				
Environment	Water Qualit	У					
monitoring	Site code	Name		Monitoring		Frequency	Threshold
				purpose		-	
	Acid rock	ARD		Visual monit	_	Within 24 –	@ field pH <5
	drainage	monitoring		around TSF a		48 hours	sample to
	(ARD)			rains -signs o		rainfall	laboratory
	Water	Surface		Impacts of TS		Within 24 –	OEMP
		ground w	ater	on water qua	ality in	48 hours	
		sampling		the area		rainfall	
				Impacts on			
				surface/grou			
				water quality			
		Monitorin	•	Impacts on g		OEMP	
		boreholes	S	water quality	'		
	Air Quality	Air Quality		1		T	
	Site code Name			Monitoring		Frequency	Threshold
				purpose			
	Deposition	NAQ 03, 04, Impacts of dust			Monthly	600	
	al dust	05, 06	from tailings on workers/farms/			mg/m2/day	
				community	<u> </u>	.1.1.5	
Environmental	Domain manager to report to appointed ECO (monthly)						
reporting	<ul> <li>High releases of CN to tailings.</li> <li>High sulphate seepages from TSF 3 (similar to TSF 2).</li> <li>Any areas that required vegetation removal for the month ahead.</li> <li>Appointed ECO to report to domain manager</li> </ul>					icable.	
						lal	
						nead.	
						disated (daily)	
	<ul> <li>Notify domain manager in advance when high winds are predicated (daily).</li> <li>Notify domain manager if contamination from TSF 3 detected (as per OEMP).</li> </ul>						
Environmental					Other		
Environmental	On shift mill supervisor		1	main manager Doma npletes and a			Bi-annual
inspection/s						in manager	
						o complete	compliance audit
				spection		Complete	
Supporting	Source: OEM	IP	mspe				
documents			n				
documents							
– Domain sign off, and							

REV 01 ECC Report №: ECC-107-408-REP-02-D JUNE 2023 PAGE 11 OF 12



Navachab Gold Mine (Pty) Ltd.

Domain 5 – Tailings – TSF 3 Annes to Domain 5				
	– Land clearing permit.			

JUNE 2023 REV 01 PAGE 12 OF 12 ECC Report №: ECC-107-408-REP-02-D